

17.0 MISCELLANEOUS CONDITIONS

17.1 ALLERGIC REACTIONS TO INSECTS

AEROMEDICAL CONCERNS: Local or systemic reactions to insect bites or stings may lead to incapacitation in as little as three to five minutes. This type of rapid incapacitation is incompatible with aviation duty without successful diagnosis and treatment.

WAIVER: Any history of systemic or anaphylactic reaction is considered CD for all DIF. The decision for waiver will be made on a case by case basis after review of all the available documentation. Applicants with a history of cutaneous or mild systemic reactions must have received VIT and be on a stable maintenance dose prior to submitting an application for a waiver. Applicants with severe allergic reactions will not be considered for waiver until they have completed a minimum of three years of VIT and have demonstrated a documented negative repeat skin test.

INFORMATION REQUIRED:

1. A thorough summary of all allergy history and symptoms
2. Allergy consultation confirming the diagnosis and documenting the treatment plan
3. Medical records of previous treatments may also be required

TREATMENT: Venom Specific Immunotherapy (VIT) is required for all adult individuals experiencing systemic or anaphylactic reactions. Cutaneous systemic reactions prior to the age of 16 do not require treatment with VIT and do not require a waiver. These individuals have a minimal risk of systemic reaction as an adult (approximately 10%). However, anaphylactic reactions in individuals less than 16 years of age require allergy/immunology consult and skin testing. If positive, VIT is required for a career in aviation. Carrying an Emergency Anaphylactic kit (adrenaline) does not preclude a member from consideration for a waiver. In fact, treatment with adrenaline is paramount in reducing morbidity and mortality from allergic reactions to insect stings and bites. In some instances it may be required to carry in the performance of aviation duty. The requirement to carry an emergency anaphylactic kit will be based on the severity of the reaction and the recommendation of the Allergy/Immunology specialist.

DISCUSSION: A generalized reaction to 100 wasps is a normal response, which does not fulfill the criteria of the generalized reaction described above. Anaphylaxis from a single sting is different matter.

ICD-9 CODES:

- 989.5** Insect Bite, unknown effect of venom
- V15.6C** Insect Bite, Hx of, not resulting in generalized reaction
- V15.6F** Insect Bites, Hx of, resulting in generalized reaction
- V07.10** Allergy, currently taking desensitization shots
- V07.11** Allergy, History of desensitization shots

17.2 BREAST IMPLANTS

AEROMEDICAL CONCERNS: Possible shifting of the implants during high G flight causing pain and/or distraction to the pilot during flight.

WAIVER: Not considered disqualifying provided a minimum of six weeks has elapsed since the surgery.

INFORMATION REQUIRED:

1. Written clearance from surgeon to resume unlimited physical activity.

TREATMENT: Not Applicable

DISCUSSION: The Navy and Air Force have limited experience with aviators with breast implants, however, to date there have not been any reports of adverse events. There has been one report in the civilian literature of discomfort at altitude due to expansion of air in a saline implant.

ICD-9 CODE:

P85.54 Breast Implants

17.3 HEAT EXHAUSTION / HEAT STROKE

AEROMEDICAL CONCERNS: Recurrence of heat exhaustion/heat stroke in the aviation/operational environment.

WAIVER:

1. Heat Cramps, single or multiple episodes: NCD
2. Heat Exhaustion: NCD unless severe or recurrent
3. Heat Stroke: CD, waiver considered on a **case by case** basis. Waiver disposition may be favorable if the following conditions are met:
 - a. No evidence of a congenital predisposing condition (i.e., anhidrosis)
 - b. An identifiable situational stressor led to the episode, such as dehydration, coexisting infectious disease, medication effect, fatigue, sleep deprivation, or lack of acclimatization.
 - c. No residual injury exists
 - d. A minimum of three months have passed since the episode of heat stroke
 - e. Evidence of normal heat tolerance after recovery from the heat stroke episode
 - f. Individuals who fail to meet these criteria will remain NPQ with no waiver recommended. Recurrent episodes of heat stroke are CD, with waiver unlikely

INFORMATION REQUIRED:

1. Severe or recurrent heat exhaustion or one episode of heat stroke will require evaluation by NOMI Internal Medicine

TREATMENT: Prevention is the key. Encourage slow acclimatization to stressful environments and encourage liberal intake of fluids.

DISCUSSION: Heat stress continues to be a significant environmental hazard in military aviation. Exertional heat stroke (EH) is a state of extreme hyperthermia that occurs when excess heat generated by muscular exercise exceeds the body's ability to dissipate it. It should be remembered that an initial rectal temperature of less than 105 degrees does not preclude the diagnosis of heat stroke. Loss or significant alteration of consciousness in the circumstances of physical exertion in hot weather should be considered heat stroke unless another cause is obvious.

Studies show that exertional heat stroke in a young, healthy (military) individual result from situational factors; an intrinsic predisposition to heat intolerance is extremely rare. Dehydration, febrile or infectious illness, skin disorders, poor physical fitness and obesity are well-accepted factors predisposing to heat intolerance. Some of these factors may result in only temporary heat susceptibility while others can lead to permanent heat intolerance. In many of these individuals (10 of 10 in a controlled study), the heat intolerance is temporary and reversible. Aviators with a history of heat stroke should be evaluated on a case by case basis to determine their heat tolerance status. All individuals with heat stroke will require an evaluation at NOMI by the Internal Medicine Department prior to waiver recommendation.

Several controlled studies have recommended that all heat stroke patients be tested for heat tolerance 8-12 weeks after the episode in order to determine fitness for further heat-exercise exposure. Heat stroke patients secondary to dehydration usually respond normally to a heat-exercise tolerance test 6 weeks after the episode. In a case report in which an infectious disease was the predisposing factor, normal tolerance to a heat exercise test was regained 12 weeks after the heat stroke episode. A recent study of 10 prior exertional heat stroke patients showed that none were hereditarily heat intolerant; all had multiple predisposing situational factors. The authors concluded that heat intolerance, defined as inability to acclimate to heat, occurs in a very small percentage of prior heatstroke patients.

A heat tolerance test, used by Hubbard and his colleagues at the US Army Research Institute of Environmental Medicine, consists of a subject walking on a treadmill for 90 minutes at 45% of VO₂max in a chamber maintained at 40° C and approximately 50% humidity. The test is terminated if the subject's heart rate exceeds 180 bpm or the rectal temperature exceeds 39.0 ° C.

ICD-9 CODES:

992 Heat Exhaustion / Heat Stroke

992.0 Heat Stroke

992.5 Heat Exhaustion

17.3A RHABDOMYOLYSIS

AEROMEDICAL CONCERNS: The physiologic changes that occur in rhabdomyolysis may be precipitated by and severely compounded in the aviation environment and related duties involving flight. Symptoms may include muscular pain, muscular weakness and fatigue. Decreased situational awareness and cockpit distraction are of major concern. Additionally, unrecognized rhabdomyolysis may progress to renal failure, shock, cardiac arrhythmias, and death.

WAIVER: The history of a single episode of uncomplicated rhabdomyolysis is CD for all aviation classes, including applicants, if the condition fully resolves within three months without sequelae. Waivers are usually granted, but an AMS must be submitted for waiver consideration.

Any history of prolonged, complicated or recurrent rhabdomyolysis is CD, and a waiver will be considered on a case by case basis in DESIGNATED Aviators only. Waivers are considered under the following conditions:

1. No evidence of a congenital predisposing condition (e.g., myophosphorylase deficiency, sickle cell trait).
2. An identifiable situational stressor led to the occurrence, such as extreme physical exertion, trauma or muscle compression, dehydration, electrolyte abnormality, coexisting infectious disease, toxin exposure, medication effect, or fatigue.
3. No residual organ injury or damage is present.
4. A minimum of three months has passed since the episode of rhabdomyolysis.

INFORMATION REQUIRED:

1. Internal Medicine consultation.
2. Glomerular filtration rate (GFR)
3. Blood urea nitrogen and creatinine
4. Glomerular filtration rate
5. Complete blood count
6. Liver function tests
7. Creatinine kinase
8. Complete metabolic panel

Note: Consider thyroid function testing

DISCUSSION: Rhabdomyolysis is a syndrome characterized by muscle necrosis and release of intracellular muscle constituents into the circulation. The disease process can range from mild, asymptomatic enzyme elevations to life-threatening cases involving cardiac arrhythmias, disseminated intravascular coagulation, acute renal failure, and death. The classic presentation of rhabdomyolysis includes myalgias, myoglobinuria causing reddish to brown urine, and elevated serum muscle enzymes. Diagnosis is based upon fractionated serum skeletal muscle creatine kinase levels, which may exceed 100,000 IU/L, and appropriate clinically correlated history. While no specific cutoff for creatine kinase level is used to diagnose rhabdomyolysis, a serum level 5 times greater than baseline is the generally accepted level. Germaine to the

aviation environment is the fact that rhabdomyolysis affects patients in a 3:1 male to female preponderance and is exacerbated by extreme heat and load-bearing activity, both of which persist as constant environmental hazards in military aviation. Additional predisposing conditions and causal factors include prolonged unconsciousness resulting in extended dorsal muscle compression, struggling against restraints, episodes of near drowning, burns, sepsis, torture victims, high-voltage electrical injuries, compartment syndrome, hyperthermia, hypothermia, prolonged tourniquet application, seizures, sporadic extreme physical exertion (i.e., ultra-marathoners), dehydration, inappropriate nutritional supplement use, and pre-existing electrolyte abnormalities. Prognosis is generally favorable provided a correctable condition or causative action is identified in those cases that do not progress to acute renal failure. There is concern, however, that multiple sub-clinical episodes of rhabdomyolysis and acute renal insufficiency may predispose patients to early onset chronic renal insufficiency later in life. Additionally, the causal and predisposing factors listed above are synergistic and the chances of developing rhabdomyolysis increase as the number of the risk factors increase.

ICD-9 CODES:

728.88 RHABDOMYOLYSIS

791.3 MYOGLOBINURIA

17.4 HIV INFECTION

AEROMEDICAL CONCERNS: Persons with HIV infection are at risk for multiple complications including HIV encephalopathy, opportunistic infections, and malignancies. Treatment of HIV infection requires the use of antiretroviral medications with multiple side effects and drug interactions. Mandatory restrictions on deployability preclude operational assignment.

WAIVER: NOMI does not recommend waivers for HIV infected personnel.

INFORMATION REQUIRED: The management of HIV seropositive individuals is covered under SECNAVINST 5300.30C. NOMI requires a grounding physical when the diagnosis of HIV infection is established.

TREATMENT: The adoption of highly active antiretroviral therapy (HAART) with three-drug regimens has resulted in much improvement in short-term survival rates. The recommended regimens involve the use of two nucleoside reverse transcriptase inhibitors (N-RTI) plus either a protease inhibitor (PI) or efavirenz, a non-nucleoside reverse transcriptase inhibitor (NN-RTI). Drug regimens involving less than three antiretroviral drugs are contraindicated. Some of the potential side effects of these regimens include anemia, leucopenia, thrombocytopenia, hepatitis, pancreatitis, peripheral neuropathy, lactic acidosis, rash, diarrhea, abdominal pain, nephrolithiasis, glucose intolerance, hyperlipidemia, etc. Non-adherence to HAART regimens (less than 95% compliance) greatly increases the risk of development of multi-drug resistant (MDR) HIV strains. No waivers are recommended for the use of HAART.

DISCUSSION: Some individuals, particularly civilian HIV authorities, view the military's policy of permanent disqualification for HIV infected aviators unfounded in fact, but NOMI's position has always been that, per the MANMED, untreated chronic infections are CD, no waivers recommended. Untreated HIV can also cause renal failure, anemia, leucopenia, and thrombocytopenia in addition to the opportunistic infections and malignancies. HIV encephalopathy results in cognitive and motor deficits that can impair the ability to fly high performance aircraft. An HIV-infected person is more likely (30%) to develop pulmonary tuberculosis in the first two years after initial infection with an annual rate of 5% thereafter. HIV-infected individuals are more likely to transmit tuberculosis to other people.

The mean incubation period between HIV-1 infection and symptomatic AIDS is 8-10 years. Estimates are that 100% of those infected with HIV but not treated with HAART will progress to AIDS given sufficient time. The indications for initiation of HAART can occur years before the development of symptomatic AIDS. Initiation of HAART is recommended when the CD4 lymphocyte count is less than 500 cells/mm³ and/or the HIV viral load is greater than 20,000/mL copies by reverse transcriptase polymerase chain reaction (RT-PCR). Treatment with HAART improves survival in AIDS patients and may slow the onset to symptomatic AIDS (see above). However, the side effects associated with HAART severely limit its compatibility with duty involving flying.

AIDS-defining events have changed radically since the disease was first described. In someone whose HIV-1 status is known to be positive, the list of conditions defining the transition to AIDS is broad. Additions, reflecting an increased awareness of AIDS in women, include invasive cervical cancer and unresponsive or poorly responsive vulvovaginal candidiasis. The treatment and prophylaxis of AIDS-related opportunistic infections have improved. The prophylactic medications also have many side effects. Some antiretroviral agents, especially the PIs, have drug interactions with AIDS-related prophylactic medications and medications for non-HIV-related conditions.

ICD-9 CODE:

795.8 HIV Infection

17.5 LYME DISEASE

AEROMEDICAL CONCERNS: Early infection with *Borrelia burgdorferi* generally results in the characteristic cutaneous rash known as erythema migrans. Later in the course of the disease, chronic meningitis, polyneuropathy or Bell's palsy can develop. Months to years later, an arthritis can be the predominant feature. Note that all these conditions can appear in any order and at any time during the course of the infection. *B. burgdorferi* can also cause a myo/pericarditis, conjunctivitis, and retinal hemorrhage or detachment.

WAIVER: The protean manifestations of the condition and the variability of the presentations dictate an individualized approach to waiver recommendation. In general, adequately treated erythema migrans without signs of dissemination will be NCD.

Any case that is clinically suspicious for disseminated Lyme disease that is substantiated by appropriate serology (acute IgM titer, rising IgG titers) is CD. CNS findings will require complete resolution, and a period of observation before waiver recommendation will be considered.

Persistent abnormalities will be permanently disqualifying, with no waiver recommended.

INFORMATION REQUIRED:

1. NOMI evaluation is necessary for all cases of suspected disseminated Lyme disease
2. Uncomplicated erythema migrans in the appropriate clinical setting can be diagnosed and treated at the local level

TREATMENT: Many antibiotic regimens have been suggested, but treatment failures have occurred with all of them. Tetracycline (250 mg qid for 14-30 days) is generally advocated for early Lyme disease. Once systemic signs are apparent, intravenous ceftriaxone (2 gr IV qd for 14 days) is recommended. Other regimens can be used for patients allergic to the first line antibiotic.

DISCUSSION: The diagnosis is often made clinically, based on an exposure history in an area endemic for Lyme borreliosis. Serology studies can be misleading in that there are many false positive tests. The diagnosis should be made with caution if exposure occurred in an area that is not endemic for the arthropod hosts, as this will incur potentially significant costs to the patient and his/her career. The rationale for this is that even in an endemic area for the spirochete, only 15% of collected ticks were infected. Prophylactic antibiotics following a tick bite, even in an endemic area are not recommended, based on the low likelihood of contracting asymptomatic Lyme disease.

ICD-9 CODE:

088.81 Lyme Disease

17.6 MOTION SICKNESS / AIR SICKNESS

AEROMEDICAL CONCERNS: Symptoms can include sweating, nausea, drowsiness, lethargy, apathy, headache and vomiting. This spectrum can range from distraction to prostration in the air. The degradation in performance of trainees could be attributed incorrectly to lack of skill.

WAIVER: Aircrew with intractable airsickness are NPQ, no waiver. However, there is a Self-Paced Airsickness Desensitization (SPAD) program available at NOMI which is an option prior to permanent grounding.

INFORMATION REQUIRED: If the airsickness interferes with performance in flight, the patient will be evaluated by the flight surgeon to rule out medical causes (neurovestibular) and then referred to NOMI if appropriate.

TREATMENT: The majority of aircrew become habituated to the stimuli and does not require treatment other than regular flying. Others may benefit from a combination of desensitization, biofeedback training, relaxation training and psychological counseling. Promethazine (Phenergan) 25mg combined with dextroamphetamine (DEXEDRINE) 5 mg taken 1 hour prior to flight is permitted for up to 3 flights during training, provided the patient is accompanied in flight by an instructor pilot. If symptoms recur following discontinuation of medication, this is the appropriate time for referral to the SPAD program at NOMI.

DISCUSSION: In the RAF, 39% of flying students have air sickness at some stage during their training and in 15% this is sufficiently severe to disrupt or abandon the flight. The USN experience is that 13.5% of all flights will lead to airsickness in non-pilot crews with vomiting occurring in 5.9%. Up to 63% of students were sick on their first flight, with only 15-30% not experiencing airsickness at all during their training. Females are almost twice as likely to suffer as males and the incidence declines with age. Treatment by biofeedback training, relaxation and psychological counseling achieves a success rate of 40%; when exposure to incremental Coriolis effect and flying is included, the success rate rises to 85%. All of the drugs used for motion sickness control have unacceptable side effects. Scopolamine and antihistamines act as central depressants; the former particularly degrades tasks that involve continuous attention and memory storage, as well as causing blurred vision, sedation and dizziness in some individuals. In flight conditions mild enough to cause airsickness in only 10% of the untreated population, 0.4mg of scopolamine will reduce that number to 2%. Similarly, in rough conditions causing airsickness in 50%, 1mg of the drug will reduce the incidence to 8% but with unacceptable side effects.

ICD-9 CODE:

994.6 Motion Sickness/ Air Sickness

17.7 MOTION SICKNESS QUESTIONNAIRE

MOTION SICKNESS QUESTIONNAIRE

During your physical examination, you marked *yes* on the SF93 (Report of Medical History) for the item concerning *Car, Train, Sea or Air Sickness*. Please answer the following questions fully:

Which mode of transportation gives you motion sickness?

How often do you get sick?

When was the last occurrence?

Do you ever go on rides at carnivals?

If yes, do you ever get sick?

If yes, which rides make you sick?

If no, what is the reason?

If you suffer from airsickness, which types of aircraft make you sick?

How often do you suffer from airsickness?

If you suffer from sea sickness, what type (size) ships or boats seem to bother you most?

How often do you get car sickness?

If you suffer from car sickness, do you ever do anything that makes this worse? (e.g. reading etc.)

What is the severity of your motion sickness?

Have you ever required any medication?

If yes, give name, dosage, and frequency.

If any item has been missed concerning your motion sickness, please explain in detail:

Applicant Signature & SSN

Date:

17.8 BONE MARROW DONATION

AEROMEDICAL CONCERNS: Bone marrow donation is certainly one of the most altruistic forms of giving to another individual. However, there are significant donor concerns. Bone marrow donation will ground the aviator for at least 30 days and has the potential for complications that could restrict deployment or even end a flying career. Depending on how well the Human Leukocyte Antigens (HLA) are matched, up to 5% of the recipients will require a second donation that will further restrict the deployability of the aviator donor. If an aviator is contemplating a donation, the Flight Surgeon needs to counsel the donor regarding the risks involved and the Commanding Officer needs to be aware of the 30 day minimum grounding with the potential for longer grounding. CO approval for donation is required.

WAIVER: (Applicants and designated aviators). Not considered disqualifying and waiver not required, provided:

1. Minimum of 30 days has elapsed since the bone marrow donation
2. Post-donation symptoms have resolved
3. Hematocrit is greater than or equal to 38% for males, 35% for females
4. The remaining Complete Blood Count (CBC) with differential is within normal limits.

Post-donation CBC may take up to six months to return to normal. A waiver for designated aviators is required if post-donation symptoms persist or if CBC results do not return to normal after six months. Waivers will not be considered for applicants.

INFORMATION REQUIRED:

1. CBC with differential must be repeated at the aviator's next two flight physicals (long or short form)
2. If post-donation symptoms persist or serum lab values remain abnormal, the waiver information must include:
 - a. Copy of the operative report
 - b. Copies of follow-up visits
 - c. Current medications
 - d. CBC with differential
 - e. TIBC
 - f. Serum Iron
 - g. Ferritin

TREATMENT: For bone marrow donation or peripheral blood stem cell (PBSC) donation iron therapy may be used before the donation and for up to six months post-donation without a waiver. After six months post-donation, a waiver is required. (Up to six months of post-donation iron therapy is for bone marrow and PBSC donation only; other reasons for taking iron therapy will require a waiver.)

DISCUSSION: Bone marrow transplant is used to treat more than 60 diseases including leukemia, aplastic anemia, thalassemias and Hodgkin's disease. The science of bone marrow transplant continues to evolve and the process is rapidly maturing; however, there are still numerous questions regarding the long-term effects on donors. Short-term effects have been

studied and donors report the following morbidity as a result of operative bone marrow harvesting:

1. Fatigue 75%
2. Pain at collection site 68%
3. Pain with walking 63%
4. Nausea/Vomiting 55%
5. Lower back pain 52%
6. Recovery >30 days 10%

Potential donor complications include:

1. Anemia requiring iron therapy 63%
2. Acute complications 6%
3. Allogeneic transfusion 0.6%
4. Life-threatening complications 0.06%

Peripheral blood stem cell (PBSC) harvesting is the relatively newer procedure being used to obtain bone marrow stem and progenitor cells. The procedure involves giving donors recombinant granulocyte colony stimulating factor (GCSF) for several days while monitoring daily CD34+ cells. When the CD34+ cells are highest, apheresis removes stem and progenitor cells. Typically, donors tolerated this procedure very well and prefer it to bone marrow harvest. Donors report myalgias/arthralgias (83%), fatigue (57%), headache (44%), fever/chills (27%), and nausea/vomiting (22%). Reported laboratory test abnormalities include a moderate, asymptomatic reversible neutropenia, lymphocytopenia, platelet depletion, and increased liver enzyme levels that typically return to baseline within weeks. Aviator donors are grounded when receiving GCSF and for 30 days post-apheresis. To return to flight status the aviator who donates by apheresis must meet the same criteria as for bone marrow donation.

Both bone marrow donation and PBSC apheresis have potential morbidity. Both procedures place the aviator at risk for a longer than 30 day recovery, and carry a slight risk of jeopardizing the aviator's future flying status. Because these risks can impact mission effectiveness, the unit CO must also be aware of the potential impact on the donor's flight status.

Flight Surgeons, after you return aviators to flight status, please contact NOMI, Code 42, with the length of grounding, length of symptoms, any complications encountered, and if iron therapy is being continued. NOMI can then expand its aviator-donor database to further refine waiver guidance.

The C. W. Bill Young Marrow Donor Recruitment and Research Program in Washington DC is the DOD donor registry for all active duty personnel, their dependents, DOD civilians employees, Reserves, National Guard, and the Coast Guard. The center supports donor recruitment, medical evaluation, and marrow collection for DOD volunteer marrow donors. For more information about the DOD marrow donation program or for general information about donation they may be reacted at 1-800-MARROW3 or visit their web site at www.nmri.nmcc.navy.mil.

This guidance pertains to bone marrow and PBSC donation only. Future harvesting procedures will be addressed as they mature.

17.9 MALARIA

AEROMEDICAL CONCERNS: Malaria is the most important parasitic disease in humans and is endemic in over 100 countries. Over 3 billion people are at risk of developing malaria and 1-2 million die each year. This translates to about 150 to 300 deaths each and every hour. Although it is rare in the United States, it is of particular concern for military members who are traveling to endemic regions of the world. Additionally, the military accounts for 90% of the malaria cases imported into the United States.

The primary concern for the military member and aviator is prevention of the disease. In addition to vector control and personal protective measures, chemoprophylaxis is indicated for areas with endemic malaria. The primary drugs used in the prophylaxis of malaria are chloroquine, doxycycline, mefloquine, primaquine, and atavaquone/proguanil (Malarone).

The following guidance applies only to Aeromedical disposition. Treatment of malaria should be accomplished under close supervision of infectious disease or other appropriate specialists as circumstances dictate. Proper chemoprophylaxis is determined by the appropriate Fleet, Force, or Unit Medical Officer. If flight surgeons have questions regarding proper chemoprophylaxis they are encouraged to call the Navy Environmental and Preventive Medicine Unit (NEPMU) in their region or the Centers for Disease Control (CDC) and to check with the appropriate Combatant/Component Command regarding the preferred drugs for chemoprophylaxis for their region.

WAIVER: Active cases of malaria are clearly disqualifying and the member is down during the time of active disease and treatment. Appropriate supportive care and medication should be provided by the treating medical facility. Once the member has no signs of active disease, has completed the treatment course, and is been cleared for full duty, he may resume flight duties. No waiver is required. Active cases of malaria should be reported to the appropriate Fleet authority, BUMED, CDC, and NAMI Code 342 for tracking purposes.

Primary chemoprophylaxis refers to the use of drugs taken to prevent symptoms associated with the blood stage infection. These drugs are taken before, during, and after travel to an endemic area.

Mefloquine is **NOT** allowed for use in Aviation Personnel, except for treating active cases during which period the aviator is not flying.

PRIMARY CHEMOPROPHYLAXIS

The following primary chemoprophylaxis drugs are authorized with the following guidelines:

Chloroquine - This is the primary prophylaxis only in areas with chloroquine-sensitive *P. falciparum*. It is given as 300 mg base (500 mg salt) orally once per week. Potential adverse effects include headaches, dizziness, and GI symptoms. The member should be grounded 48 hours after taking first dose. Members who have taken chloroquine previously without side effects do not require a grounding period.

Doxycycline – This is the primary prophylaxis in chloroquine resistant areas. It is given as a 100 mg oral daily dose. The member should be grounded 48 hours after taking first dose. The most common side effects include photosensitivity, GI discomfort, and vaginal candidiasis. Ensure that doxycycline is taken with food to decrease GI side effects and increase compliance. Members who have taken doxycycline previously without side effects do not require a grounding period.

Malarone (atovaquone/proguanil) – This is the primary alternate to doxycycline for primary prophylaxis in chloroquine and/or mefloquine resistant areas. It is given as one atovaquone/proguanil (250/100 mg) tablet taken daily with food. The medication is started 1-2 days prior to entering the malaria-endemic area and continued for 7 days upon exiting the area. It may also be used to treat active malaria at the increased dose of atovaquone/proguanil (1000/400 mg) once daily for 3 consecutive days. At the prophylactic dose, the side effects are similar to those seen with placebo. At higher treatment doses, GI and liver enzyme abnormalities may be seen. Malarone is effective against both blood and liver stages of *P. falciparum*, but it is NOT effective against liver stages of *P. vivax* or *P. ovale*. Therefore, it is still necessary to provide additional terminal prophylaxis with Primaquine for 14 days when exiting an endemic vivax or ovale area. The main drawback of the medication is expense. The grounding period for initial use is 24 hours and those who have previously tolerated Malarone do not require a grounding period.

Primaquine – This can be used as primary prophylaxis for short duration travel to areas with principally *P. vivax*. This drug should only be used in special circumstances where chloroquine, doxycycline, or Malarone are clearly contraindicated. The most common reason for this would be drug allergy or adverse drug reaction. It should only be given as primary prophylaxis in close consultation with a malaria expert. Contact the CDC Malaria Hotline (770-488-7788) or regional NEPMU for additional guidance.

TERMINAL PROPHYLAXIS

Primaquine – Primaquine is currently used as terminal prophylaxis and is given as a 30 mg daily dose taken for 14 days after leaving endemic regions with *P. vivax* and *P. ovale*. This drug is contraindicated in members with G6PD deficiency. The member should be grounded for 48 hours after taking first dose. Members who have taken primaquine previously without side effects do not require a grounding period.

The general recommendation for all medications is a 48 hour grounding period, except in individuals who have previously taken the medication and had NO side effects. Certain operational circumstances may not allow for a 48 hour grounding period. In these circumstances, it is the responsibility of the flight surgeon to inform the commanding officer of the possible side effects and complications that may result from using the medication without an observation period. Approval to use these medications without a 48 hour grounding period is made by written authorization by the commanding officer on the advice of the flight surgeon.

INFORMATION REQUIRED: Inform NAMI Code 342 of all active cases of Malaria.

DISPOSITION: Active cases of Malaria are disqualifying while the member has the disease. It is no longer disqualifying when all symptoms have resolved, the treatment course is complete, and the member is returned to full duty. Chemoprophylaxis is not disqualifying when it meets the requirements noted above. The Combatant/Component Commander (example-AFRICOM) has the final determination of the preferred drug used for chemoprophylaxis.

Additional Resources:

www.cdc.gov/malaria

Malaria Pocket Reference Guide

<http://www-nmcphc.med.navy.mil/downloads/prevmed/malaria/MalariaPocketGuide2007.pdf>

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